Claims

1. A digital imbalance correction device, comprising

input means adapted to receive first input signals (I-in, Q-in) containing a plurality of channels from an I/Q converter stage at respective input terminals, each input terminal being associated to a respective signal branch,

a time-to-frequency-domain-transforming means (FFT) adapted to perform a transformation of said first input signals from time-domain into frequency-domain, the transformation result being represented as a power spectrum of said respective first input signals,

a subtracting means arranged to receive at its inputs second input signals which are represented by the power spectra of said respective transformed first input signals and to output the gain difference as a function of frequency at its output,

a cross-correlation means arranged to receive at its inputs third input signals based on said input signals, and to output a cross-correlation of said third input signals, said cross-correlation output being proportional to a phase error between said respective correlation input signals,

a gain correction means arranged in one of said respective signal branches and receiving at its input a fourth input signal based said associated first input signal, wherein a gain of said fourth input signal is corrected based on said power difference spectrum such that said gain of said fourth input signal equals the gain of the other one of said first input signals, and

a phase correction means arranged in one of said respective signal branch and receiving at its input a fifth input signal based said associated first input signal, wherein a phase of said fifth input signal is corrected based on said cross-correlation output, such that said

phase of said fifth input signal is in quadrature relation to the other one of said first input signals.

2. A device according to claim 1, wherein said phase correction means comprises controllable delay elements.

3. A device according to claim 1, wherein said gain correction means comprises controllable amplifier element.

4. A device according to claim 1, wherein said input means further comprise analog-to-digital converter means adapted to covert analog input data to digital data.

5. A device according to claim 1, further comprising a channelizer means arranged to receive at its respective inputs the phase-corrected and gain-corrected signals based on said first input signals associated to said respective signal paths and adapted to demodulate said signals into the respective individual channels.

6. A device according to claim 1, wherein in one of said signal branches (Q) said first input signal equals the third input signal, while in the other of said signal branch (I) said first input signal equals the fourth input signal, the third input signal equals the fifth input signal, with the third and the fifth input signals being equal to the gain-corrected fourth input signal.

7. A device according to claim 1, wherein in one of said signal branch (Q) said first input signal equals the third input signal, while

in the other of said signal branch (I) said first input signal equals the third and the fourth input signal, and the fifth input signal equals the gain-corrected fourth input signal.

8. A device according to claim 1, wherein

in one of said signal branches (Q) said first input signal equals the third input signal, while

in the other of said signal branches (I) said first input signal equals the third and the fifth input signal, and the fourth input signal equals the phase-corrected fifth input signal.

9. A device according to claim 1, wherein

said gain correction means and said phase correction means are arranged in the same respective signal branch.

10. A device according to claim 1, wherein

said gain correction means and said phase correction means are arranged in respective different ones of said signal branches.

11. A digital imbalance correction method, comprising the steps of

inputting first input signals (I-in, Q-in) containing a plurality of channels and resulting from an I/Q conversion,

time-to-frequency-domain-transforming said inputted first signals to perform a transformation of said first input signals from time-domain into frequency-domain, the transformation result being represented as a power spectrum of said respective first input signals,

subtracting the power spectra of said respective transformed first input signals and outputting the gain difference as a function of frequency,

performing a cross-correlation based on said input signals, and outputting said cross-correlation which is proportional to a phase error between said respective correlation input signals,

performing a gain correction for said input signals based on said power difference spectrum such that said gain of said input signals equals each other, and

performing a phase correction for said input signals based on said cross-correlation such that said phase of said input signals is in quadrature relation to each other.

12. A method according to claim 11, wherein said phase correction step comprises controlling a delay.

13. A method according to claim 11, wherein said gain correction step comprises controlling an amplification.

14. A method according to claim 11, wherein said inputting step further comprise analog-to-digital conversion to covert analog input data to digital data.

15. A method according to claim 11, further comprising a channelization step which processes the phase-corrected and gain-corrected signals based on said first input signals and demodulates said signals into the respective individual channels.